WHAT IS CLAIMED IS:

1. A hydrogel polymer blend composition prepared by crosslinking a hydrogel polymer blend precursor composition comprising:

a) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

b) a second polymer comprising functionality for selectively binding a biomolecular analyte, wherein the functionality for selective binding a biomolecular analyte in the first polymer and the second polymer can be the same or different, and

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinking functionality and the functionality for selective binding a biomolecular analyte provide the hydrogel precursor polymer blend composition with, respectively, the ability to be photocrosslinked into the hydrogel and the ability of the hydrogel to selectively bind to the biomolecular analyte.

2. The composition according to claim 1, wherein the first polymer is prepared by homopolymerizing or copolymerizing one or more monomers.

3. The composition according to claim 1, wherein the first polymer is prepared by copolymerizing monomers to form a copolymer comprising photocrosslinkable functionality and functionality for selective binding a biomolecular analyte.

4. The composition according to claim 1, wherein the first polymer is prepared by synthetically modifying a first prefunctionalized polymer to introduce the photocrosslinkable functionality.

5. The composition according to claim 1, wherein the first polymer, the second polymer, or both is a water-soluble polymer.

6. The composition according to claim 1, wherein the first polymer comprises a linear polymer backbone having side groups that comprise photocrosslinkable functionality and the second polymer comprises a linear polymer backbone having side groups that comprise the functionality for selectively binding a biomolecular analyte.

7. The composition according to claim 1, wherein the first polymer comprises about 0.5 mole % to about 15 mole % monomeric subunits comprising photocrosslinkable functionality.

8. The composition according to claim 1, wherein the first polymer and the second polymer each have weight average molecular weight of about 1,000 to about 10,000,000.

9. The composition according to claim 1, wherein the photocrosslinkable functionality is a UV-curable functionality.

10. The composition according to claim 1, wherein the photocrosslinkable functionality is at least one of benzophenone, diazo ester, aryl azide, and diazirine, or derivatives thereof.

11. The composition according to claim 1, wherein the photocrosslinkable functionality comprises benzophenone groups or derivatives thereof

12. The composition according to claim 1, wherein the functionality for selective binding is covalently binding with the biomolecular analyte.

13. The composition according to claim 1, wherein the functionality for selective binding is non-covalently binding with the biomolecular analyte.

14. The composition according to claim 1, wherein the hydrogel composition further comprises an energy absorbing moiety.

15. The composition according to claim 1, wherein the functionality for selective binding

is a chromatographic or biospecific binding functionality.

16. The composition according to claim 1, wherein the hydrogel composition is substantially free of photoinitiator, and further comprises a fluorescent group.

17. The composition according to claim 16, wherein the first polymer comprises a linear polymer backbone having side groups that comprise photocrosslinkable functionality, and the second polymer comprises a linear polymer backbone having side groups that comprise the functionality for selective binding, and wherein the first and second polymers are water-soluble polymers.

18. The composition according to claim 16, wherein the first and second polymers are water-soluble polysaccharide polymers, and the first polymer is prepared by synthetically modifying a first prefunctionalized polymer to introduce the photocrosslinkable functionality.

19. The composition according to claim 1, wherein the crosslinking is a photocrosslinking.

20. The composition according to claim 1, wherein the crosslinking is a thermal crosslinking.

21. A hydrogel polymer blend composition prepared by:

A) crosslinking a hydrogel polymer blend precursor composition comprising:

i) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

ii) a second polymer which can be synthetically modified to comprise functionality for selectively binding a biomolecular analyte, whereby a crosslinked hydrogel is formed;

B) synthetically modifying the crosslinked hydrogel so it comprises functionality for selective binding to a biomolecular analyte,

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinkable functionality and the functionality for selective binding, provide the hydrogel precursor polymer blend with the ability to be photocrosslinked into a hydrogel and the hydrogel to be selectively bind to the biomolecular analyte.

22. A hydrogel polymer blend composition according to claim 21, wherein the crosslinking is a photocrosslinking.

23. A hydrogel polymer blend composition according to claim 21, wherein the crosslinking is a thermal crosslinking.

24. The composition according to claim 21, wherein the composition is substantially free of photoinitiator.

25. The composition according to claim 21, wherein the first polymer, the second polymer, or both is a water-soluble or water-swellable polymer.

26. The composition according to claim 21, wherein the first polymer is prepared by homopolymerizing or copolymerizing one or more monomers.

27. The composition according to claim 21, wherein the first polymer is prepared by copolymerizing monomers to form a copolymer comprising photocrosslinkable functionality and functionality for selectively binding a biomolecular analyte.

28. The composition according to claim 21, wherein the first polymer is prepared by synthetically modifying a first prefunctionalized polymer to introduce the photocrosslinkable functionality.

29. The composition according to claim 21, wherein the first polymer comprises a linear polymer backbone having side groups that comprise photocrosslinkable

functionality and the second polymer comprises a linear polymer backbone having side groups that comprise a functionality for selective binding.

30. The composition according to claim 21, wherein the first polymer comprises about 0.5 mole % to about 15 mole % of monomeric subunits comprising photocrosslinkable functionality.

31. The composition according to claim 21, wherein the first polymer and the second polymer each have weight average molecular weight of about 1,000 to about 10,000,000.

32. The composition according to claim 21, wherein the first polymer and the second polymer are each water-soluble.

33. The composition according to claim 21, wherein the photocrosslinkable functionality is a UV-curable functionality.

34. The composition according to claim 21, wherein the photocrosslinkable functionality is at least one of benzophenone, diazo ester, aryl azide, and diazirine, or derivatives thereof.

35. The composition according to claim 21, wherein the composition further comprises a fluorescent group.

36. The composition according to claim 21, wherein the composition further comprises an energy absorbing moiety.

37. The composition according to claim 21, wherein the functionality for selective binding is for covalently binding with the biomolecular analyte.

38. The composition according to claim 21, wherein the functionality for selective binding is for non-covalently binding with the biomolecular analyte.

39. The composition according to claim 21, wherein the functionality for selective binding is a biospecific binding group or a chromatographic binding group.

40. The composition according to claim 21, wherein the functionality for selective binding is an adsorbent group.

41. The composition according to claim 21, wherein the first polymer comprises a linear polymer backbone having side groups that comprise photocrosslinkable

functionality, and the second polymer comprises a linear polymer backbone having side groups that comprise functionality for selective binding, and wherein the first and second polymers are water-soluble polymers.

42. The composition according to claim 21, wherein the first and second polymers are water-soluble polymers, and the first polymer is prepared by synthetically modifying a first prefunctionalized polymer to introduce the photocrosslinkable functionality of the first monomer subunits.

43. The composition according to claim 21, wherein the first and second polymers comprise hydroxyl groups.

44. The composition according to claim 21, wherein the first and second polymers are polysaccharides.

45. The composition according to claim 21, wherein the first and second polymers comprise hydroxyl groups.

46. The composition according to claim 21, wherein the first and second polymers are polysaccharides.

47. The composition according to claim 21, wherein the first and second polymers are modified dextrans.

48. The composition according to claim 45, wherein the composition is substantially free of photoinitiator.

49. The composition according to claim 46, wherein the composition is substantially free of photoinitiator.

50. The composition according to claim 47, wherein the composition is substantially free of photoinitiator.

51. A substrate that comprises a substrate surface and a hydrogel polymer blend composition thereon, wherein the composition comprises (i) a first polymer comprising crosslinked functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and (ii) a second polymer comprising functionality for selectively binding a biomolecular analyte, which can be the same or different as the functionality for selective binding a biomolecular analyte for the first polymer.

52. The substrate according to claim 51, wherein the substrate surface is the surface of a primer layer.

53. The substrate according to claim 51, wherein the substrate surface is planar.

54. The substrate according to claim 53, wherein the substrate surface is the surface of a primer layer and wherein the hydrogel is a uniform layer.

55. The substrate according to claim 53, wherein the substrate surface is the surface of a primer layer and wherein the hydrogel is in the form of discreet spots.

56. The substrate according to claim 53, wherein the hydrogel is covalently bound to the substrate surface.

57. The substrate according to claim 51, wherein the first and second polymers comprise polysaccharide, and the first polymer comprises crosslinked benzophenone functionality.

58. The substrate according to claim 51, wherein the hydrogel is substantially free of photoinitiator.

59. The substrate according to claim 52, wherein the hydrogel is substantially free of photoinitiator.

60. The substrate according to claim 56, wherein the hydrogel is substantially free of photoinitiator.

61. The substrate according to claim 51, wherein the functionality for selective binding of the biomolecular analyte is for covalent binding of biomolecular analyte.

62. The substrate according to claim 51, wherein the functionality for selective binding of the biomolecular analyte is for non-covalent binding of biomolecular analyte.

63. The substrate according to claim 51, wherein the hydrogel polymer blend composition is a film having a film thickness of about one micron to about 10 microns.

64. The substrate according to claim 51, wherein the hydrogel polymer blend composition

further comprises a fluorescent polymer.

65. The substrate according to claim 51, wherein the hydrogel polymer blend composition further comprises a fluorescent group.

66. The substrate according to claim 51, wherein the hydrogel polymer blend composition further comprises an energy absorbing moiety.

67. The substrate according to claim 51, wherein the substrate is a biochip.

68. The substrate according to claim 51, wherein the biomolecular analyte is a protein.

69. The substrate according to claim 51, wherein the substrate is a biochip, the biomolecular analyte is a protein, and wherein the hydrogel polymer blend composition is a film having a film thickness of about one micron to about 10 microns.

70. The substrate according to claim 69, wherein substrate surface is the surface of a primer layer.

71. A method for functionalizing a surface with a hydrogel composition comprising:

(A) providing (i) a substrate presenting a surface, and (ii) a composition according to claim 75 or 76,

(B) contacting the composition according to claim 85 or 86 to form a layer of the composition on the surface,

(C) crosslinking at least some of the composition on the surface to form hydrogel in contact with the surface.

72. The method according to claim 71, wherein the substrate surface is the surface of a primer layer that is supported by a support layer.

73. The method according to claim 71, wherein the crosslinking is a photocrosslinking and is selective such that some of the composition is crosslinked and some of the composition is not crosslinked.

74. The method according to claim 73, wherein the selective photocrosslinking provides discreet spots of photocrosslinked hydrogel.

75. The method according to claim 71, wherein the composition that is crosslinked is a

substantially uniform layer on the substrate surface and has an average layer thickness of about 5 nm to about 10 microns.

76. The method according to claim 71, wherein the substrate is a substrate for a biochip.

77. The method according to claim 71, wherein the composition is substantially free of photoinitiator.

78. The method according to claim 72, wherein the composition is substantially free of photoinitiator.

79. The method according to claim 73, wherein the composition is substantially free of photoinitiator.

80. The method according to claim 75, wherein the composition is substantially free of photoinitiator, and wherein the substrate is a substrate for a biochip.

81. The method of making the composition according to claims 85 or 86 comprising the step of mixing the first and second polymers to form the hydrogel precursor polymer blend.

82. A particle comprising the hydrogel polymer blend composition according to claim 1 or 21.

83. A method for detecting a biomolecular analyte comprising: (i) contacting the substrate according to claim 51 with a sample that contains a biomolecular analyte and then (ii) detecting the biomolecular analyte by virtue of its binding the functionality for selective binding.

84. A crosslinked blend of a first polysaccharide and a second polysaccharide that is substituted with one or more crosslinking groups.

85. A hydrogel precursor polymer blend composition comprising:

a) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

b) a second polymer comprising (i) functionality for selectively binding a biomolecular analyte, wherein the functionality for selective binding a biomolecular analyte in the first polymer and the second polymer can be the same or different, or (ii) one or more energy absorbing moieties,

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinking functionality and the functionality for selective binding a

biomolecular analyte provide the hydrogel precursor polymer blend composition with, respectively, the ability to be photocrosslinked into a hydrogel and the ability of the hydrogel to selectively bind to the biomolecular analyte.

86. A hydrogel precursor polymer blend composition comprising:

a) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

b) a second polymer which can be synthetically modified to comprise functionality for selectively binding a biomolecular analyte,

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinkable functionality, provide the hydrogel precursor polymer blend with the ability to be photocrosslinked into a hydrogel.

87. A hydrogel polymer blend composition comprising:

a) a first polymer comprising a photocrosslinked functionality, and

b) a second polymer comprising (i) one or more functionalities for selectively binding a biomolecular analyte by non-covalent binding, (ii) one or more functionalities for selectively binding a biomolecular analyte by covalent binding, or (iii) one or more energy absorbing moieties, or combinations thereof.

88. A hydrogel polymer blend composition according to claim 87, wherein the second polymer comprises (i) one or more functionalities for selectively binding a biomolecular analyte by non-covalent binding.

89. A hydrogel polymer blend composition according to claim 87, wherein the second polymer comprises (ii) one or more functionalities for selectively binding a biomolecular analyte by covalent binding.

90. A hydrogel polymer blend composition according to claim 87, wherein the second polymer comprises (iii) one or more energy absorbing moieties.

91. A hydrogel coating kit comprising:

(a) a first composition comprising a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

(b) a second composition comprising a second polymer comprising (i) functionality for selectively binding a biomolecular analyte, wherein the functionality for selective binding a biomolecular analyte in the first polymer and the second polymer can be the same or different, or (ii) one or more energy absorbing moieties.

92. A hydrogel coating kit comprising:

(a) a first composition comprising a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

(b) a second composition comprising a second polymer which can be synthetically modified to comprise functionality for selectively binding a biomolecular analyte.

93. A hydrogel polymer blend composition prepared by crosslinking a hydrogel polymer blend precursor composition comprising:

a) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

b) a second polymer comprising an energy absorbing functionality, and

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinking functionality and the energy absorbing functionality provide the hydrogel precursor polymer blend composition with, respectively, the ability to be photocrosslinked into the hydrogel and the ability of the hydrogel to promote desorption of associated analytes into the gas phase when struck by a high energy source such as a laser.

94. A hydrogel polymer blend composition prepared by crosslinking a hydrogel polymer blend precursor composition comprising:

a) a first polymer comprising a photocrosslinkable functionality, wherein the first polymer optionally also comprises functionality for selectively binding a biomolecular analyte, and

b) a second polymer, and

wherein the hydrogel further comprises reactive groups capable of forming a covalent bond with a biomolecule and

wherein the amounts of the first and second polymers, and the amounts of the photocrosslinking functionality and the energy absorbing functionality provide the hydrogel precursor polymer blend composition with the ability to be photocrosslinked into the hydrogel.